Newsroom

April 30, 2007

Georgia Southern University

Tu receives grant from AT&T Foundation for industrial ecology project

APRIL 30, 2007

Industrial ecology is the study of economic activity and its interrelationship with the environment. Scientists who work in this field are constantly searching for ways to enhance both economic and environmental efficiency.

With the help of a $25,000 grant from the AT&T Foundation, an assistant professor in the Department of Geology and Geography at Georgia Southern University will be conducting a project that will contribute to the development of industrial ecology.

Wei Tu said his study will focus on the structural change of the U.S. economy and its environmental implications in the information age.

'More specifically, I am looking at the potential substitution between energy and material flows in the production process," said Tu, who teaches geography at the University.

He pointed out that while energy can be relatively rare and expensive, information is much more readily available.

'In the traditional industrial economy, we need production factors such as labor, capital and land to produce goods and services," Tu said. 'To produce a car, for example, we need iron, cotton, plastics, et cetera. The production factors can substitute for each other to some degree like high-performance plastics for steel.

'In the information economy, information is ubiquitous, abundant and low cost. Theoretically, information can also be an indirect production factor to substitute for other factors such as energy during the production process.

'However, there is a lack of empirical studies on this theoretical stipulation. My project will attempt to investigate the substitution between energy and information sectors in the U.S. regional economy during the 1990s."

The formal title of Tu's project is 'Integrating Structural Economics Approaches and Geographic Information Systems to Study Substitution Information for Energy: Towards an Industrial Ecology to the Information Ecology."

Running through Summer 2008, the project is being funded by the AT&T Industrial Ecology Faculty Fellowships Program, which is designed to stimulate interdisciplinary research and curriculum development that involves social issues, engineering, the sciences, economics, management,

business, law and public policy issues. The AT&T Foundation awards only three of these grants in the U.S. each year.

Noting that industrial ecology is called the 'science of sustainability" by some scholars, Tu said his project will contribute to the development of the field by innovatively taking information flows into both its methods and concepts.

'This project explicitly responds to recent calls for an industrial ecology approach to the information society and for an industrial ecology with an economic angle and approaches," he said.

Much of the Tu's research will be conducted by using data collected from the U.S. Bureau of Economic Analysis.

'The main datasets are county level input-output tables," he said. 'I am going to construct models based on these tables and analyze the structural change and sector substitution using shift-share analysis and input-output analysis.

'The results will be mapped out using Geographic Information Systems (GIS). I will develop a conceptual framework of industrial ecology that enables a synergistic study of both physical and information flows from a structural economics perspective. I will also investigate the substitution of information for energy in the U.S. economy at regional levels."

Tu believes the project will benefit all industrial ecologists.

'They will gain structural economics approaches to systematically analyze the interdependence of materials, energy use, information flows and environment at a variety of spatial and temporal scales," he said.

In addition, Tu said the project will contribute to Geographic Information Sciences.

'The project will integrate structural economics approaches into GIS using a loosely coupled approach," he said. 'GIS practitioners will gain enhanced economic modeling functions, and industrial ecologists will gain powerful mapping, visualization and spatial analysis abilities."

Finally, Tu said the project will also contribute to environmental management and policy.

'The project will supply important evidence to better understand the long-term relationship between materials, energy use, information, environment and economic well-being at a variety of spatial scales," he said. 'The refinement of the conceptual premises and methodological approaches of industrial ecology will provide a solid base for improved environmental policy-making."